

AB-276U

10/810,091

IN THE SPECIFICATION:

Please amend the following headings and paragraphs as indicated:

Field of the Invention

~~[0002] The present invention generally relates to implantable drug delivery systems and methods, and more particularly relates to utilizing such devices to deliver one or more therapeutic drugs, possibly combined with electrical stimulation, to a vagus nerve as a treatment for movement disorders.~~

Background of the Invention

[0003] Movement disorders are neurologic syndromes characterized by either an excess or a paucity of movement. These disorders affect approximately two million Americans, including over one million suffering from benign essential tremor, and half a million suffering from Parkinson's Disease. A substantial percentage of those afflicted with movement disorders experience a significant decrease in quality of life, suffering such problems as incapacitating tremor, limited mobility, bradykinesia (difficulty consciously initiating movement), dysarthria (difficulty with speech), and consequent social isolation. The etiology of many movement disorders, e.g., benign essential tremor, is poorly understood. For other movement disorders, e.g., Parkinson's disease, the mechanism of the disorder and even the brain cells affected have been identified, but even with optimal care the disease may not be reversed and may even continue to progress.

[0016] In 2001, Handforth et al. studied whether VNS could suppress tremor in the harmaline tremor model in the rat [Handforth et al. "Suppression of harmaline-induced tremor in rats by vagus nerve stimulation." Movement Disorders, 2001 Jan; 16(1):84-8]. Animals were chronically implanted with helical leads around the left vagus nerve and a disk-shaped electrode positioned subcutaneously in the dorsal neck. Harmaline-induced tremor was recorded on a physiograph while each animal received a sequence of five 20-minute trials. Each trial consisted

AB-276U

10/810,091

of five minutes of pre-stimulation baseline, five minutes of VNS, and ten minutes of post-stimulation. VNS significantly suppressed harmaline-induced tremor. The suppressive effect was present within the first minute of stimulation and was reproducible across the five trials of the study. The results of this study suggest that the central generator or expression of tremor in the harmaline animal model can be suppressed by VNS. This further suggests that VNS may be an effective therapy for ET and/or other movement disorders.

#### Brief Summary of the Invention

[0018] The ~~invention~~ subject matter disclosed and claimed herein provides systems and methods for introducing one or more stimulating drugs to the vagus nerve and/or its branches for treating or preventing movement disorders, as well as the symptoms and pathological consequences thereof. According to some embodiments of the ~~invention~~, the stimulation increases excitement of the vagus nerve and/or its branches, thereby treating or preventing movement disorders. In some embodiments, electrical stimulation is applied together with the drug(s).

#### Detailed Description of the Invention

[0038] The following description is of the best mode presently contemplated for carrying out the ~~disclosed techniques and systems~~ invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of describing the general principles of the invention. The scope of the invention should be determined with reference to the claims.

[0041] Thus, as described in more detail herein, the ~~present invention provides~~ techniques described herein including providing stimulating drugs, ~~with the optional addition of and/or~~ electrical stimulation, to stimulation site(s) on the left vagus nerve, the right vagus nerve, and/or branches thereof. As used herein, stimulate, stimulation, and stimulating refer to infusion of a stimulating drug(s) and/or supplying electrical current pulses. As such, infusion parameters and/or electrical current parameters are sometimes referred to herein as simply stimulation

AB-276U

10/810,091

parameters, which parameters may include amplitude, volume, pulse width, infusion rate, and the like. Similarly, stimulation pulses may be pulses of electrical energy and/or pulses of drugs infused by various means and rates of infusion, such as intermittent infusion, infusion at a constant rate, and bolus infusion.

[0045] Thus, therapy is provided in accordance with the teachings of the present invention by infusion of one or more stimulating drugs, ~~with the optional addition of~~ and/or electrical stimulation, by one or more system control units (SCUs). In the case of drug infusion only, an SCU comprises an implantable pump or the like. For the optional electrical stimulation, SCUs include a microstimulator and/or an implantable pulse/signal generator (IPG), or the like. In cases requiring electrical stimulation in addition to drug infusion, more than one SCU [[is]] may be used. Alternatively, when needed and/or desired, an SCU provides one or more stimulating drugs and electrical stimulation.